CLAIMS

What is claimed is:

1. A polypeptide having a WIF domain which maintains pluripotency without differentiating a stem cell.

2. The polypeptide according to claim 1, wherein the WIF domain comprises at least five amino acids among about position 30 to about position 180 of the sequence set forth in SEQ ID NO: 4.

3. The polypeptide according to claim 1, wherein the WIF domain comprises the sequence of about position 30 to about position 180 of the sequence set forth in SEQ ID NO: 4.

4. The polypeptide according to claim 1, wherein the polypeptide further includes an EGF like repeat.

5. The polypeptide according to claim 4, wherein the EGF like repeat comprises at least one repeat consisting of $CX_3CX_5CX_5CXCX_8CX_4$ where C is cysteine and X is any amino acid.

6. The polypeptide according to claim 1, wherein the polypeptide has the sequence set forth in SEQ ID NO: 4.

7. The polypeptide according to claim 1, wherein the stem cell is a hematopoietic stem cell.

8. A composition for maintaining pluripotency without differentiating a stem cell comprising a polypeptide having a WIF domain.

9. The composition according to claim 8, wherein the polypeptide further has an EGF like repeat.

10. The composition according to claim 8 wherein the polypeptide has the sequence set forth in SEQ ID NO: 4.

11. The composition according to claim 8 further comprising a stem cell survival agent.

12. The composition according to claim 8, wherein the

stem cell survival agent is stem cell factor (SCF).

13. A stem cell which does not differentiate *in vitro* and maintains pluripotency.

14. The stem cell according to claim 13 which is a hematopoietic stem cell.

15. The stem cell according to claim 13 wherein the period of said pluripotency maintenance is at least six days.

16. The stem cell according to claim 13, wherein the pluripotency comprises a capability of differentiating into blood cells.

17. A long period pluripotency maintaining cell composition comprising a stem cell and a polypeptide having a WIF domain.

18. The long period pluripotency maintaining cell composition according to claim 17, wherein the polypeptide further comprises an EGF like repeat.

19. The long period pluripotency maintaining cell composition according to claim 17, wherein the stem cell is hematopoietic cell.

20. The long period pluripotency maintaining cell composition according to claim 17, wherein at least 10^2 cells of the stem cell exist therein.

21. The long period pluripotency maintaining cell composition according to claim 17, wherein the polypeptide having the WIF domain comprises the sequence set forth in SEQ ID NO: 4.

22. The long period pluripotency maintaining cell composition according to claim 17, wherein the polypeptide having WIF domain is present at least at 0.1 ng/ml therein.

23. The long period pluripotency maintaining cell composition according to claim 17 further comprising stem

cell survival agent.

24. The long period pluripotency maintaining cell composition according to claim 23, wherein the stem cell survival agent is SCF.

25. The long period pluripotency maintaining cell composition according to claim 23, wherein the stem cell survival agent is FLT-3 ligand.

26. The long period pluripotency maintaining cell composition according to claim 23, wherein the stem cell survival agent is present at least at 1 ng/ml therein.

27. The long period pluripotency maintaining cell composition according to claim 23 for preparing differentiated cells wherein the differentiated cells are used for treating disorders of blood cells.

28. A method for maintaining pluripotency without differentiating a stem cell, comprising the step of:

1) providing the stem cell with a polypeptide having a WIF domain.

29. The method according to claim 28 wherein the polypeptide further comprises an EGF like domain.

30. The method according to claim 28 wherein the stem cell is a hematopoietic cell.

31. The method according to claim 28 wherein the stem cell is present at least at 10^2 cells.

32. The method according to claim 28 wherein the polypeptide having the WIF domain comprises the sequence set forth in SEQ ID NO: 4.

33. The method according to claim 27 wherein the polypeptide having the WIF domain is present at least at 0.1 ng/ml.

34. The method according to claim 27 further comprising the step of:

2) providing a stem cell survival agent with the stem

cell.

35. The method according to claim 34, wherein the stem cell survival agent is SCF.

36. The method according to claim 34, wherein the stem survival agent is FLT-3 ligand.

37. The method according to claim 34 wherein the stem cell survival agent is present at least at 1 ng/ml.

38. A method for producing a long period pluripotency maintaining cell composition comprising the steps of:

1) providing a stem cell;

2) treating the stem cell with a polypeptide having a WIF domain; and

3) collecting the stem cell treated.

39. The method according to claim 38 wherein the polypeptide having the WIF domain further comprises an EGF like repeat.

40. The method according to claim 38 wherein the stem cell is a hematopoietic stem cell.

41. The method according to claim 38 wherein the stem cell is present at least at 10^2 cells.

42. The method according to claim 38, wherein the polypeptide having the WIF domain comprises the sequence set forth in SEQ ID NO: 4.

43. The method according to claim 38, wherein the polypeptide having the WIF domain is present at least at 0.1 ng/ml.

44. The method according to claim 38 further comprising the step of

2) providing the stem cell with a stem cell survival agent.

45. The method according to claim 44 wherein the stem cell survival agent is SCF.

46. The method according to claim 44 wherein the stem

cell survival agent is flt-3 ligand.

47. The method according to claim 44, wherein the stem cell survival agent is present at least at 1 ng/ml.

48. A method for treating a disease or disorder originating from a disorder of a differentiated cell, comprising the steps of:

1) administering a long period pluripotency maintaining cell composition to a subject wherein the long period pluripotency maintaining cell composition comprises:

a stem cell; and

a polypeptide having a WIF domain.

49. The method according to claim 48, wherein the polypeptide having the WIF domain further comprises an EGF-like repeat.

50. The method according to claim 48 wherein the differentiated cell is a blood cell.

51. The method according to claim 48 wherein the stem cell is a hematopoietic cell.

52. The method according to claim 48 wherein the stem cell is present at least at 10^2 cells.

53. The method according to claim 48 wherein the polypeptide having the WIF domain comprises the sequence set forth in SEQ ID NO: 4.

54. The method according to claim 48 wherein the polypeptide having the WIF domain is present at least at 0.1 ng/ml.

55. The method according to claim 48 wherein the long period pluripotency maintaining cell composition further comprises a stem cell survival agent.

56. The method according to claim 55 wherein the stem cell survival agent is SCF.

57. The method according to claim 55 wherein the stem

cell survival agent is flt-3 ligand.

58. The method according to claim 55, wherein the stem cell survival agent is present at least at 1 ng/ml.

59. The method according to claim 48 further comprising the step of differentiating the stem cell.

60. The method according to claim 48 wherein the subject is a human.

61. The method according to claim 48 wherein the polypeptide having the WIF domain is a human recombinant WIF-1 comprising the sequence set forth in SEQ ID NO: 4.

62. A pharmaceutical composition for treating a disease or disorder originating from a disorder of a differentiated cell comprising:

a stem cell;

a polypeptide having a WIF domain; and

a pharmaceutically acceptable carrier.

63. A pharmaceutical composition according to claim 62 wherein the polypeptide further comprises an EGF-like repeat.

64. The pharmaceutical composition according to claim 62 wherein the differentiated cell is a blood cell.

65. The pharmaceutical composition according to claim 62 wherein the stem cell is a hematopoietic cell.

66. The pharmaceutical composition according to claim 62 wherein the stem cell is present at least at 10^2 cells.

67. The pharmaceutical composition according to claim 62 wherein the polypeptide having the WIF domain is WIF-1.

68. The pharmaceutical composition according to claim 62 wherein the polypeptide having the WIF domain is present at least at 0.1 ng/ml.

69. The pharmaceutical composition according to claim

62 further comprising a stem cell survival agent.

70. The pharmaceutical composition according to claim 62, wherein the stem survival agent is SCF.

71. The pharmaceutical composition according to claim 69, wherein the stem cell survival agent is flt-3 ligand.

72. The pharmaceutical composition according to claim 69 wherein the stem cell survival agent is present at least at 1 ng/ml.

73. The pharmaceutical composition according to claim 69 wherein the disease or disorder is a human disease or disorder.

74. The pharmaceutical composition according to claim 62 wherein the polypeptide having the WIF domain is recombinant human WIF-1 comprising the sequence set forth in SEQ ID NO: 4.

75. Use of a polypeptide having a WIF domain for maintaining the pluripotency of a stem cell without differentiation.

76. The use according to claim 75 wherein the polypeptide further comprises an EGF like repeat.

77. The use according to claim 75, wherein the stem cell is a hematopoietic cell.

78. The use according to claim 75, wherein the stem cell is present at least at 10^2 cells.

79. The use according to claim 75, wherein the polypeptide having the WIF domain comprises the sequence set forth in SEQ ID NO: 4.

80. The use according to claim 75, wherein the polypeptide having the WIF domain is present at least at 0.1 ng/ml.

81. The use according to claim 75, combined with the use of a stem cell survival agent.

82. The use according to claim 81, wherein the stem cell survival agent is SCF.

83[82]. The use according to claim 81, wherein the stem cell survival agent is flt-3 ligand.

84[83]. The use according to claim 81, wherein the stem cell survival agent is present at least at 1 ng/ml.

85[84]. The use according to claim 75 wherein the disease or disorder is a human disease or disorder.

86[85]. The use according to claim 75 wherein the polypeptide having the WIF domain is human recombinant WIF-1 comprising the sequence set forth in SEQ ID NO: 4.